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THE MANAGEMENT OF A CENTRAL MUNICIPAL GARAGE

Where should the garage be located in the city organization? What is its job? How should it be financed? What records should be kept?

A central garage is the keystone of efficient equipment management. As costs continue to rise, city officials are becoming more conscious of the need to economize on city operations by finding a more efficient way of doing the job. Some cities have adopted a centralized plan of managing their motor equipment and other equipment, bringing it under the care of the central garage supervised by a trained superintendent. To obtain information on the operation of central garages questionnaires were sent to city officials of San Diego, Calif.; Rochester, N. Y.; Raleigh, N.C.; Cincinnati and Toledo, Ohio; Dallas, Tex.; Kenosha, Superior, and West Bend, Wis. Information supplied by these cities is summarized in this report. Not all of these cities have the same type of central garages. That is, their garages supply different types of services, some of them very complete services, and others only a few. In some of these cities the garages do not have control over the vehicles they repair. These differences are pointed out in this summary.

Organization. The central garage is a service agency for all the city departments, the same as a printing plant, central purchasing, central personnel office, central accounting and other housekeeping services. Its purpose is to keep city motor and other equipment rolling at all times. The garage should be tied in with the city's organization in a manner that will assure maximum service with the least amount of interdepartmental friction. Theoretically the garage should be under the supervision of a staff agency rather than a line or operating department. Sometimes newly established services like a central garage are placed under the immediate supervision of the chief administrative officer of the city. This may be the logical place for some cities but in many cities it would increase the already heavy administrative burden of top management.

The purchasing agent or some other official who is in charge of other maintenance services might supervise garage operations. Toledo and Superior placed their garages under the finance department and the city manager, respectively. But seven of the nine cities covered in this survey place the garage in the public works department. This department with its many pieces of equipment and trained maintenance men seemed to be best suited to the task of maintaining the equipment of the other departments as well.

The Job of the Central Garage. How far should the responsibility of the central garage extend over the city's automotive and other equipment? What the garage offers in the way of services depends largely on its authority over the equipment. The central garage can exert close control to assure economical operation as well as proper maintenance and repair. Under such a plan the garage might purchase the vehicles, acting either in an advisory or controlling capacity with regard to the type of vehicle that should be bought. It would

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provide complete services, such as body repair, engine overhaul, upholstery finishing, and painting. Or it may provide only repair and service facilities with the equipment remaining under departmental management. In addition the central garage under either plan may also operate a car pool, assigning cars to departments as requested with the garage supplying the best vehicle for the purpose. Furthermore, its repair facilities may be limited offering only tire servicing or light engine repair.

The central garage should in theory have control over all motor equipment of the city. But only the garages of Dallas, San Diego, and Superior exercise management control over some or all of the city's motor vehicles. In the other six cities--Rochester, Cincinnati, Kenosha, West Bend, Toledo, and Raleigh--the central garage maintains and repairs the vehicles but they remain under departmental management. Yet the Dallas and Rochester central garages operate car pools for employees who use city cars only occasionally. In Raleigh the superintendent of motor equipment has the authority to ban any driver he believes to be incompetent.

One measure of the extent to which the central garage exercises management control over the city's vehicles is the number of city departments that rent equipment from the garage. In Dallas and Superior the garage rents the equipment to all but the fire department; in San Diego to all departments except the police, fire, and harbor departments; and in Kenosha the equipment is rented only to the park and street departments. In Cincinnati, Raleigh, Rochester and Toledo the central garage does not rent equipment to the other departments except that Rochester operates a car pool.

Another measure of the extent to which the central garage controls vehicles is the number of departments operating their own repair garages. This measure is not entirely adequate because the central garage may repair all vehicles of the city but exercise managing control over none of them. As a rule fire departments maintain their own apparatus in most cities so that the fire chief always knows the condition of his equipment and is assured of quick repair for emergency uses. Cincinnati is the only city of the nine surveyed where the central garage repairs fire department apparatus. Police vehicles usually are maintained by the central garage except in Rochester where private concerns do the work and in San Diego where the police as well as the harbor department have their own repair facilities.

Services Supplied by Central Garage. The economies of the central garage are achieved to the fullest extent only in the few cities that can offer complete vehicle repair and servicing, even to the point of manufacturing some of the repair parts. Central garages in the smaller cities usually make only minor repairs, oil and lubricate vehicles, and wash and clean vehicles.

Few central garages can offer the extensive services provided in Dallas, Cincinnati, and San Diego. In San Diego, for example, the central garage has five sections: dispatch, blacksmith, machine, services and maintenance, and parking meter. The dispatch section exercises equipment control functions and furnishes hauling and messenger services. The blacksmith section sharpens tools; builds and installs bodies, beds, and special equipment; and furnishes welding service with portable generators to all city departments. The machine shop rebuilds trucks and industrial engines and manufactures and repairs parts for all types of mechanical equipment. This section also supplies general machine shop service in the construction of any machines, tools, and equipment. The service and

maintenance section services all types of industrial, motor, and rolling equipment and provides lubrication, washing, steam cleaning, and fuel dispensing services. This section also repairs, overhauls, and rebuilds passenger cars, trucks of all types, graders, tractors, rollers, and other types of equipment. The parking meter section maintains the meters as well as collect the coins.

Emergency services are often required, for example, at night when police patrol cars and street sweepers break down on city streets--tires must be changed, radios go out of service, and engines fail. Night shop operations often consist of cleaning and making minor repairs to the equipment to eliminate the defects listed by the drivers on their reports. The shops may also supply gasoline to the fire trucks during extended duty at fires.

Financing the Garage. How the central garage is financed depends largely on the policies under which it operates. If it is not self-supporting, then funds must come from budget appropriations. But if the garage is to be partially or entirely self-supporting, then the departments must pay for the use of the motor vehicles and other equipment.

Several methods can be used to finance the central garage. The garage may be financed through a separate fund, usually a revolving fund, with or without its own bank account or through a clearing account within the general fund. The clearing account would be charged with the expenses of the garage and credited with the payments of the department renting the equipment. Some cities cannot set up revolving funds without a charter amendment and so the clearing account may be just as satisfactory. Seven of the nine cities surveyed finance their garages through revolving funds--Dallas, Kenosha, Raleigh, San Diego, Superior, Toledo, and West Bend--with the equipment rented out to the city departments at established rates per mile or per hour. Neither Rochester or Cincinnati employ a revolving fund for these two cities finance their garages by budget appropriations except that Cincinnati makes some charges against the departments.

Regardless of the method used to finance the central garage, records must be kept of garage and equipment expenses, with costs kept for each piece of equipment. An accounting system for central garages and motor equipment is set forth in "Accounting for Government-Owned Motor Equipment" (Municipal Finance Officers Association, 1313 East 60th Street, Chicago 37. 60pp. 50 cents).

Financing the Replacement of Equipment. One of the major reasons for central management of equipment, including the charging of rents for the use of vehicles, is to eliminate the ups and downs of vehicle replacement. A municipality may go along for years on a starvation diet of poor vehicle transportation, minimum maintenance, high costs, and then in a sudden burst of enthusiasm replace the old equipment all at once. Then the city repeats the cycle of hard use, no maintenance, and pinchpenny economy. The idea behind the depreciation portion of the rental charge is to accumulate funds during the working life of the equipment to pay for its replacement.

Few cities finance equipment replacement by depreciation reserves. Only three of the nine cities reporting on replacement financing policies indicate that reserves are accumulated from the rental charges--Dallas, Superior, and West Bend. Rochester utilizes depreciation reserves built up from budget appropriations over a period of years. In five other cities--San Diego, Kenosha, Cincinnati, Toledo, and Raleigh--the replacement of motor vehicle and other

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equipment is financed from funds appropriated to each department.

An equipment replacement fund consists of a series of small reserves with each piece of equipment having its own "bank account" indicating the funds accumulated for that vehicle. The fund is not used to purchase new equipment for which there is no corresponding piece of old equipment. This does not mean, however, that an exact replacement must be made but only that a machine fulfilling the same purpose must be bought. Obsolete equipment should be replaced as later models of proved experience come off the assembly line. The replacement funds, like the other funds of the city, should be managed by the chief finance officer although withdrawals or allocations from the fund might well be approved by the city manager or the mayor.

Obviously, some cities are not able to pay for replacements entirely from depreciation earnings if the rental charges are not high enough. These cities usually supplement their depreciation earnings by budget appropriations to finance the purchase price of new equipment. For example, in Plymouth, Michigan, if the income from any piece of equipment is not sufficient to pay the annual depreciation, the deficit is prorated among the departments according to their use of the equipment during the past year. On the other hand, purchases must be made to replace old equipment from the equipment funds before the vehicle has accumulated sufficient reserves. In such cases the profits of the central garage or subsidies from the general fund must be made to provide for replacement. Equipment funds, unless subsidized by initial grants from the general fund, may take as long as five years to become self-supporting.

Equipment Rental Charges. Budgeting for municipal transportation costs is considerably simplified if charges are established for each piece of equipment that is to be rented by the central garage. By estimating the number of hours or miles he expects to use each piece of equipment, the department head can estimate his annual equipment costs for rollers, graders, power hammers, pavement breakers, and the like.

Rental charges usually consist of two elements: the cost of operations and a depreciation charge. The operating charge includes not only such direct costs as gas, oil, repairs, servicing, and the like, but also a share of the overhead cost. The depreciation charge consists of an estimated rate at which the capital investment of the vehicle is being used up.

Rental charges can be based on estimates to get the plan under way although the estimate should be replaced with charges geared to costs as soon as possible. The schedule of rates ought to be printed and made available to all city departments. Revisions of the rate schedule may be necessary as economies are achieved through the operation of the central garage or central equipment management plan; or changes can be made as the cost of labor and supplies goes up or down. Furthermore, the schedule ought to separate the operating charges from the depreciation rates so that the city departments renting the equipment can see what they are paying for.

Central garages in all five cities that rent equipment to other city departments include indirect expenses, such as overhead and depreciation, in their rental charges as well as direct costs for repairs and maintenance--Dallas, Kenosha, West Bend, Superior, and San Diego. Their charges not only vary according to the type of equipment, but the unit of charge--hour, mile, day--also may vary. Superior, for example, rents passenger cars by the month while all other

equipment is rented by the hour. West Bend rents police cars and pickup trucks on a mileage basis but all other equipment is rented on an hourly basis.

In San Diego and Dallas cars and trucks usually are rented on a mileage basis, and graders, tractors, and rollers are on an hourly basis. The rates established by San Diego in July 1, 1948, for some of the equipment are as follows: mileage rates--passenger cars 6 cents per mile, panel trucks 7 cents, station wagons 7 cents, bookmobile 14 cents, dump truck under two tons 10 cents; hourly rates--dump trucks of two to four tons 65 cents per hour, dump trucks of five tons and over $1.45 per hour, light graders $1.50, heavy graders $1.60, shovels $2.85, sprinklers $1.25, and rollers $1.40.

The depreciation expense is an important element of the equipment rental charge. If new equipment purchases are to be financed from a replacement fund, then a depreciation charge must be levied to accumulate the necessary money. The problem then is to determine a depreciation charge for each piece of motor equipment. A depreciation charge may be calculated several ways and the most common method is called "straight-line" depreciation, whereby the original value less salvage value is charged off at uniform amounts over the period of time the vehicle is expected to be used. One variation of this method is to charge greater amounts of depreciation in the early life of the vehicle and then gradually decrease the charge (down to a minimum amount) as the vehicle becomes older. This variation is unnecessary when an appraised value is calculated for each vehicle on the annual inventory date and a re-estimated salvage value is deducted from the appraised value on that date. Still another method of calculating the depreciation charge is to tie the depreciation in with the vehicle's "production", that is, the amount of miles or hours the vehicle is expected to be used during its remaining useful life.

The depreciation charge for each piece of equipment ought to be calculated at least once every year. This can be done as part of the annual inventory of equipment. Each year a list should be made of all equipment owned by the city and this list should show the date the equipment was purchased, manufacturer's name, body type, motor number, original cost, appraised value on the inventory date, estimated salvage value, and as a result the net amount subject to depreciation. The next step is to allocate a share of the net value subject to depreciation to the coming year's operations. This can be done several ways. One method is to estimate the vehicle's useful life in years, say five or ten years, and add one-fifth or one-tenth of the total net value to the coming year's estimated operating costs for the vehicle. Another method is to estimate the vehicle's useful life in terms of mileage or hours, and divide the estimated net value of the vehicle by the total mileage or hours that the vehicle is expected to be used, to obtain a rate such as two cents or five cents per mile or hour to serve as the depreciation charge for the use of the vehicle.

Maintenance of Equipment. Motor equipment should be regularly inspected and maintained to keep each vehicle at top operating efficiency. Six of the nine cities report that their central garages regularly inspect the equipment under their care--Rochester, Dallas, San Diego, West Bend, Superior, and Raleigh. In Kenosha all units are greased regularly but the inspection is done at the request of the departments. In Toledo and Cincinnati the garages do not perform scheduled inspection of the equipment.

A few cities have adopted programs of preventive maintenance in order to achieve the full benefits of regularly maintained equipment. By definition,

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preventive maintenance is a method of maintaining motor vehicles so that what should be done, when it should be done, and who should do the job are all carefully planned ahead of time plus the additional step of recording the work done. Preventive maintenance is based on the fact that some automobile parts have similar life expectancies and that these can be grouped together to be inspected at regular intervals. For example, all parts needing attention at least every 2,000 miles are listed together with each part followed by a notation of key points to be inspected, adjusted, and cleaned. Similarly, all parts needing attention every 4,000 miles are listed together, as well as those to be checked at the 10,000 mile interval, 20,000 mile interval, and so forth.

The parts to be inspected and maintained at 4,000 miles include those at the 2,000 mile interval, just as those at the 10,000 mile interval include the parts to be inspected at the 4,000 mile interval. Each city would set its own inspection and maintenance schedules based on normal expectancies for auto parts but qualified by such local conditions as typical loads and speeds, shelter provided, terrain, and climate. Seasons must be taken into account in setting up a schedule to provide labor time for major overhauls at certain periods of the year, for example, the summer time checkup on snow removal equipment.

Superior has simplified its preventive maintenance procedure by developing forms of various colors that outline the jobs to be done and record some of the costs involved. The 5,000-mile checklist (green - 8" x 10") shows the truck number, speedometer reading, date, a list of parts to be checked and cleaned, gasoline, oil, and grease servicing, and the mechanic's time. The 10,000-mile checklist (yellow) lists all that the 5,000-mile checklist shows plus the additional items to be checked and maintained at the 10,000-mile limit. Similarly the 15,000-mile checklist (blue) and the 20,000-mile list (pink) lists the additional items at their respective intervals. The forms are printed on heavy paper stock suitable for rough handling in a garage and easy for the mechanic to fill out. Dallas, on the other hand, uses a single comprehensive checklist listing all the vehicle parts after which the inspector inserts a code symbol indicating whether "OK" or the extent of maintenance or repair required. Whatever form is used, the order of inspection called for should lay out the most efficient work pattern for servicing a particular vehicle.

The central garage must be prepared to make emergency repairs. Some garages operate service trucks to make minor repairs to motor equipment out on the streets or to tow the equipment into the shops. Police patrols require 24-hour service from the central garage and in some cities the servicemen on the night shift drop their usual chores and drive the service truck whenever a call comes into the central garage.

The central garage should establish rules for drivers to follow in the event of road breakdowns. Before a driver makes any minor repairs to his vehicle, he should call the central garage for instructions. Inside the cab of each vehicle there should be information on the changing of oil, chassis greasing, battery, tires, and radiator. The form ought to show the equipment number, type and make, operator's name, specific grades of oils and greases for summer and winter use, and tire pressures required for front and rear tires.

In some cities the drivers are not allowed to make any repairs. Should motor trouble develop, no matter how slight, the driver is required to call the central garage. He then explains the trouble and is instructed by the shop either to wait at that location for a service man or if the truck can be moved

under its own power, to proceed to the repair shop. After the call is received at the garage, the garage should notify the department renting the vehicle, give them the number of the truck, its location, nature of the repair required, and the probable length of time the equipment would be out of service. If a replacement is sent out, the number of this truck should be given. Under this arrangement, the department renting the equipment would always be kept informed of equipment failures during the service period. This gives the department renting the equipment an opportunity to adjust its working schedule while the vehicle is out of service.

All drivers should be required to report the condition of their equipment at the end of each day's work, whether or not any attention seems to be required. The form used for this purpose would show the date, the number of the equipment, mileage, signature of the operator, and condition of the equipment. These forms serve as the basis for laying out the work by the shop foreman for the next day, or if only a minor repair is involved, the work can be done by the night shift. In this way the equipment is ready to roll in the morning when the drivers return to the garage to pick up their vehicles.

Car Pools. Complete central management of the city's auto equipment calls for the establishment of car pools to provide transportation for the city employees who do not need vehicles on a full-time basis. Only Rochester and Dallas of the nine cities surveyed have car pools operated under the control of the central garage. The Dallas central garage theoretically pools all its vehicles with permanent assignments made to the police department and to other city employees requiring vehicles on a full-time basis.

An example of the economies of car pools is found in the experience of Kansas City, Missouri, which set up a car pool of 11 cars for 65 city employees in 1944. Every employee taking a car from the pool must sign a form showing speedometer readings when he starts and when he returns plus an explanation of the purpose of the trip. In December, 1943, the 11 cars were driven 9,050 miles at an average cost of 8 cents a mile to produce $724. The revenue was credited to a revolving fund to pay operating, maintenance, and replacement costs. Each car is marked with a large sign bearing the city's seal and car number. Cars are stored in the city garage and cannot be taken home at night by any city employee. Departments are charged 5 cents a mile and 10 cents for each half hour with a minimum charge of 20 cents.

Garage Supplies and Materials. The purchasing of garage supplies and parts should be done by the city purchasing agent. Some garage superintendents prefer to do their own buying, short circuiting the purchasing agent, on the theory that it takes too much time to make out a requisition, ask for bids, determine the acceptable bid, and finally wait for delivery. Such delays need not occur if garage purchases can be arranged so that the suppliers may offer bids at the start of each year on the parts required for the entire year. The suppliers could list their prices less discounts from the price. Then at any time during the year the city can simply order direct from the manufacturer what it needs for immediate supply. The purchase of gasoline, tires, and motor vehicles sometimes leads to disagreements between the purchasing agent, garage superintendent, and the departments using the equipment, unless there is some evidence of cost of operations or service rendered to support the purchase of any particular type of item.

What city official should be responsible for purchasing motor vehicles? The garage superintendent, the purchasing agent, and the department heads

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usually have their own ideas as to the type of vehicle needed. Certainly passenger cars for all departments except police and fire can be purchased by the purchasing agent who would use the equipment cost data plus the opinions of both the garage and the line departments as to the best vehicle. Police cars, fire trucks, and perhaps some types of refuse collection equipment plus other special types of machinery used by the public works department may require agreement between the purchasing agent, the garage superintendent, and the department regularly using the equipment. Certainly the fire department ought to have the right to specify the type of equipment that they want providing their specifications do not prevent several manufacturers from offering bids.

Gasoline should be purchased in tank car or tank wagon lots according to specifications stipulated by the city. Each delivery of gasoline must be checked to see if it meets the standards. Large cities sometimes have a chemist on the staff who can test the gasoline while the smaller municipalities may be able to send the gasoline either to a private laboratory or to the laboratory of a nearby large city in the state. If the gasoline fails to meet the specifications according to the chemist's tests, then the city should have legal redress against the gasoline company. Purchases should be made only after soliciting bids from as many companies as possible. Some cities prefer to contract with the best bidder for one year's supply while others ask for new bids every three or six months.

An underground gasoline storage tank is a necessity in any plan to purchase gasoline economically. In the smaller cities one storage tank is sufficient, but in large cities other storage tanks may be located at various points in the city to service vehicles working at some distance from the central garage. Or, an arrangement may be made with local retailers to supply gasoline at stated prices to drivers presenting fuel tickets which are honored at the end of every month.

Tires should be purchased on the basis of information obtained from the cost and service record kept on each tire. The central garage should keep careful records of every tire repair and change made. If the purchasing agent or the finance officer maintains the tire records, then the garage should have a tire change and repair slip to fill out and send it to the official keeping the tire records. Bids should be sought as in the case of any other commodity but the purchasing official should evaluate the best bid in the light of the evidence from the tire records.

Stores for the maintenance and repair of vehicles and other machinery should be kept under lock and key at the garage. A conscientious, honest storekeeper is needed to operate the storeroom under the supervision of the garage superintendent or the purchasing agent. A perpetual inventory system should be maintained with actual counts of the stock made at least once every year. No stores should be given to any mechanic unless the stores clerk is given a receipt stating the job number, mechanic's number, date, and the quantity and number of the item requested. The stores clerk should keep an eye out for stock falling below the minimum supply agreed upon by the purchasing agent and the garage superintendent. On the other hand, stocks should not be purchased for equipment that the city intends to sell as salvage and the stock supply should be kept down to a minimum consistent with safety so as to prevent an over-investment of city funds. One general rule is that the maximum stock to have on hand is the supply that would be used during the length of time it takes to replenish it. If it takes two weeks to replenish a certain item, then a two weeks supply is the maximum amount to have in the stockroom.

In too many cities inadequate space, poor layout, and disorderliness characterize the stockrooms in central garages. Unfortunately, the storing of supplies is treated as an incidental in the management of the garage. The problem is particularly difficult for the small cities where a full-time storekeeper is not warranted, and yet some control is needed over parts and supplies. As a rule, plenty of shelves, and stock bins clearly marked with identifying tags as well as neat, efficient piles of supplies too large for the bins, all behind locked doors, are the mark of a well-kept storeroom. If all this is controlled by accurate inventory records, then the storeroom is a well-managed one.

Equipment Cost Records. The official in charge of managing the city's equipment needs an equipment cost system to supply current information on what it costs to operate and maintain the city's vehicles and machinery. Not only does the city manager, mayor, and garage superintendent need this information but the rates charged for rental should be kept in line with costs. No department head wants to pay out any excess from his budget appropriations and if the rates can be shown to reflect the actual cost of operation and maintenance, then he feels that he is being charged fairly for the service he is buying.

A cost system consists of a number of forms such as the individual equipment record, equipment history record, a job order form, gasoline and oil tickets, stores requisition, labor time sheets, tire change slips and so forth. A complete description of the cost system for motor vehicles is found in "Accounting for Government-Owned Motor Equipment" (Municipal Finance Officers Association, 1313 East 60th Street, Chicago 37. 60pp. 50 cents).

A few comments might be made on one or two aspects of a cost system. The work or job order form usually is the heart of the cost system. The inspection report indicates that there is some trouble but the job order form takes over when a specific repair job is to be done. The chief mechanic prepares the job order, listing in detail the work to be done. The job order form describes the work actually performed, provides space for reporting the material and parts required, the amount and kind of labor, accessories needed, outside garage work if required, and all other costs, except overhead and general costs. The laborer's time sheet, stores requisition sheet, and outside work vouchers supplement the work order and serve as a check on the figures shown there. In some cities job orders over a certain amount must have the approval of the chief mechanic before any repair work can be started. Some system must be established to prevent uneconomical repairs to vehicles that should be disposed of. The work order can sometimes be used to show a department head what poor driving by his subordinates is costing him in the way of higher rental charges.

The information from the work order form is recorded on the equipment cost record once each month either as a monthly total or as individual work order totals. The mechanic's time card serves as the basis for preparing the pay roll and the stores requisition reports the data for the perpetual inventory system. Gasoline and oil "sales" are reported on separate tickets and must be recorded on the individual equipment forms as well as the gasoline and oil inventory records. General supervisory, telephone, light, insurance expenses are usually entered in one single overhead clearing account and then distributed among the vehicles maintained by the garage according to some formula satisfactory to the city officials.

Many worth-while cost systems collapse because the systems fail at the starting point--where the cost figures are first collected. Clerks, mechanics,

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laborers, helpers, tire service men and attendants report the cost figures at the first level. Too often the mechanic lapses into habits of slipshod reporting, which the foreman overlooks since he makes only a cursory check of the figures. The forms that the start the whole process should be simple, of various colors, sturdy stock, clear, and easily filled out. They should be handy, always in view, and designed with the mechanic or his helper in mind. Instructions should be given the garage men who will be filling in some of these forms. Their complaints about any form may be the answer to an accurate cost system.

Personnel Required for Economic Operation. The central garage ought to be self-supporting under the plan of unified equipment management. The garage should at least "break even" each year and certainly it ought not to accumulate exorbitant reserves at the expense of the departments renting the equipment. Over-loading the garage with superfluous personnel might occur if the superintendent does not have any goal to shoot at. How many helpers, mechanics, attendants a garage should have is difficult to say. It must have enough to meet the demands for prompt,efficient service. Yet its rental rates must be kept low and labor costs are usually the largest share of the rental charge. The departments renting the equipment can always check what they are paying the central garage for transportation service with what they think they can do if they handled their own equipment.

How large a staff is needed to operate a central garage? This depends on the service to be rendered. A large city needs supervisors, stock clerks, janitors, watchmen and messengers as necessary parts of a sizable working organization. If the city does its own body repair, parts manufacturing, welding, and blacksmithing, then employees are required for these tasks. Yet some measures might be made. In 1941 the superintendent of motor equipment of Dallas computed several measures to appraise his own organization. The measures are: (1) the number of vehicles per mechanic which amounted to 32.6 vehicles per mechanic in Dallas in 1941; (2) the number of sweeper units per sweeper maintenance man, ~~5~~ 56 units per man in Dallas; (3) the number of vehicles per wash and grease rack man, 56 ~~98~~ per man in Dallas; (4) the number of vehicles per tire maintenance man, 98 ~~1.5~~ per man; and (5) the number of vehicles per nonproductive man, 32.6 per nonproductive man. City officials can compute similar ratios for their own shop although care should be taken to include only the equipment for which the garage is responsible.

A garage that keeps its own records and cost of operations as well as maintains city vehicles on a preventive maintenance schedule will consequently have more staff then a garage with equally efficient personnel who do not keep cost records or schedule vehicle maintenance. Comparisons between one garage and another are extremely difficult to make, particularly among the smaller cities where a few mechanics perform a great variety of tasks. If labor time sheets are kept on each job performed by the mechanic, then the garage superintendent has some idea of the efficiency of his helpers. Not all cities, however, follow the practice of issuing a job order for each job. But some cities do require their mechanics and laborers to keep time sheets of their activities throughout the entire day. At the end of each day the garage superintendent can check them over to find out whether any particular mechanic is taking too long on a job and find out what the source of the trouble is.

Note: City officials can obtain on loan from MIS sample garage forms, work orders, preventive maintenance forms, and also pamphlets on preventive maintenance.